Abstract of the Disclosure

A method for in-situ descum/hot bake/dry etch a polyimide photoresist layer and a passivation layer in a singe process chamber is disclosed. A process chamber that can be used for conducting in-situ a descum, a hot bake and a dry etch process sequentially in the same chamber is also disclosed. In the method, a process chamber equipped with a wafer platform and a wafer backside heating and cooling device is first provided, followed by the step of positioning a wafer that has a passivation layer and a patterned polyimide photoresist layer on top of the platform. An oxygen plasma is then generated in the chamber cavity to conduct a descum process, followed by flowing a heated inert gas onto a backside of the wafer to conduct a hot bake process. A cooling inert gas is then flown onto the wafer backside and an etchant gas is flown into the chamber to conduct a dry etch process for forming a via opening in the wafer.